

The Amateur Radio

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Volume 1 Number 7

- *ATV—Ham Television*
- *Mastering The Morse Code*
- *Publicize Your Next Ham Class*
- *Get On The Air From Wherever You Are*



Get Your Family Licensed

Communicate with your family via ham radio.

by Don Stoner, W6TNS

I've tried for years to convince my wife that she should get a ham license. I used every trick in the book: "We need to communicate more;" "You could understand me better if you were a ham too;" "Look at all the people you would meet and new friends you could relate to." Nothing worked for 40 years!

Her standard response was, "I just can't learn the code, and besides, it's a silly way to talk." My rebuttal was half-hearted, I'm afraid. I had to admit that I didn't really enjoy Morse myself.

NO MORE EXCUSES!

Then, in February 1991, the FCC called her bluff. They created a new license class that did not require any code knowledge or proficiency. I explained that she didn't need to know a dit from a dah. All she had to do was pass a multiple choice written test. What could be easier? People are earning their ham license as never before—but not my bride! She still resisted my justifications.

IS THIS YOUR SITUATION TOO?

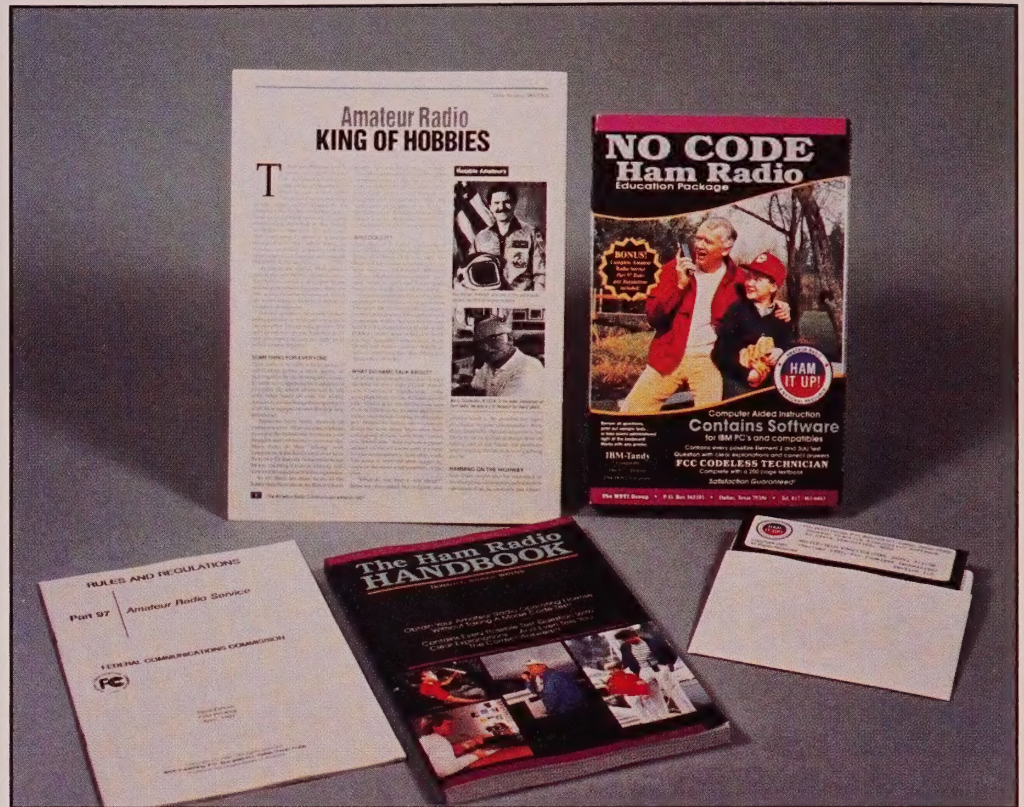
I suspect that many hams are in the same position. They would like their spouse to get a license but, like me, have approached the situation all wrong. When I started asking questions, I found that my wife didn't really like talking to strangers. And yet I was trying to convince her to get a license so she could communicate with people she didn't even know.

In the process of learning why she had resisted getting a ticket, I stumbled across her "hot button." With the breakdown of law and order in our society, she was concerned about safety for her and the children. And, with the general lack of reliability in automobiles, there was always a concern with an occasional emergency.

When I explained repeaters and how ham radio could be used to provide additional safety, I found a sympathetic ear. I showed her a borrowed hand-held that was so small it could get lost in the bottom of her purse! At last, after 40 years, she listened to my sales pitch and actually asked questions.

HOW ABOUT YOUR CHILDREN?

Teenagers know they are invincible and will live forever. Personal safety is not very high on their list of concerns. Selling the youngsters on getting an Amateur Radio license required a different tact and I found it. It's called "peer leverage."



One of my son's friends seemed curious about ham radio and asked the sort of questions that indicated a desire to get an Amateur license. I became his "elmer" and within a few weeks he took his ham test and passed. Guess who suddenly became interested in getting *his* license? Right! Within a month or so, with very little encouragement from me, my son went to the local VE group and earned his license too. Talk about peer pressure!

GET YOUR FAMILY LICENSED!

If you can convince the members of your family to get their Technician license, I've made passing the test a snap with a new publication called *The Ham Radio Handbook*. The book includes every question that might be asked on the written test and all the possible answers for each multiple choice question. My book also tells them which answer is correct along with some simplified theory to explain why.

THE DON STONER GUARANTEE

If your spouse and children can earn a ham license at all, they can do it after reading my book. I'm so sure, I'll make this guarantee. If one of your family member fails the license exam after reading *The Ham Radio Handbook*, just return everything and I'll refund the full purchase price—including postage (proof of purchase required). Anyone can pass the Technician ham test. I guarantee it!! Take advantage of my bonus education

package. I'll send the book, plus 5¼" IBM compatible software for testing your family. It will tell them when they are ready to take the test. The program displays randomly selected questions, lets one pick the correct answer and grades performance. Or, if they prefer, they can print out tests just like those that the VE's use.

The package includes a complete list of Contact Volunteer Examiners. These CVE's will be happy to tell where and when the test is being given, no matter where you live. The package has a bonus booklet which contains all the FCC Rules and Regulations on ham radio. You also receive a free copy of *The Amateur Radio Communicator*, the journal of the National Amateur Radio Association.

All this is yours if you place a free call to the National Amateur Radio Association at 1-800-GOT-2-HAM. Have your VISA or MasterCard ready. Tell the operator you want the **NARA Amateur Radio Educational Package (IBM)** for \$29.95 (\$3.00 S&H) to any U.S. address. Or, if you just want *The Ham Radio Handbook*, your cost is only \$9.95 (\$2.00 S&H). If you prefer to send a check, write to the National Amateur Radio Association, P.O. Box 598, Redmond, WA 98073-0598.

Ham radio is guaranteed to influence your life and future positively.

DO IT TODAY!!

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ON THE COVER



Our cover photo this month comes from the workshop at ICOM where Santa and his elves are busy filling

wish lists for the holiday season.

Santa is putting the finishing touches on the IC-765, while his

(Continued on page 16)

The Amateur Radio Communicator

The Amateur Radio Communicator is published monthly and is the official journal of the National Amateur Radio Association (NARA), P.O. Box 598, Redmond, WA 98073-0598.

The National Amateur Radio Association is incorporated in the State of Washington and is an exempt organization as defined in Section 501(c)(3) of the Internal Revenue Service Code.

Organization Goals

The National Amateur Radio Association is a nonprofit organization. It consists of individuals interested in the art of radio communication. The broad goal of NARA is to make Amateur Radio more widely known and to encourage more people to become involved in the Amateur Radio Service.

The organization has four specific goals within this broad framework. These are to a) publicize Amateur Radio to the general public, b) attract young people to the Amateur Radio Service, c) help existing Amateurs achieve the greatest benefit from the Amateur Radio Service and d) make Amateurs aware that our radio frequencies are in jeopardy from commercial interests.

NARA advertises in various consumer publications to create a public awareness of the Amateur Radio Service and to encourage readers to write NARA for more information. The Association also solicits authors who write on the subject of Amateur Radio in these publications. NARA has committed itself to making Amateur Radio more interesting and more accessible to all concerned.

NARA is specifically interested in encouraging young people to join our fraternity. The organization works with educators

to increase awareness of the Amateur Radio Service and its value as an interesting way of educating young people. A core of young people insures continued growth of the Amateur Radio Service.

NARA believes that existing Amateurs should be more aware of the radio communication theory. Articles that appear in *The Amateur Radio Communicator* will discuss a technical aspect of the Amateur Radio Service.

NARA is very concerned that confiscation of frequencies assigned to the Amateur Radio Service will continue. These frequencies are a precious resource. On the other hand, there are an inadequate number of frequencies to accommodate all the new communication requirements. Amateurs must create an environment where it is more beneficial to the public to have Amateur Radio operators on these frequencies than new and emerging commercial services.

Membership and Subscriptions

Those joining NARA receive a subscription to *The Amateur Radio Communicator* for a period of one year. The combined cost of membership and magazine is \$10.00 per year in all areas with a U.S. ZIP code.

The NARA membership and subscription to *The Amateur Radio Communicator* cannot be separated. Since NARA is a nonprofit corporation, the membership cost may be tax deductible. Verify this with your accountant.

It is not necessary to hold an Amateur Radio license to become a member of the National Amateur Radio Association. The only "qualification" is an interest in radio communications.

Editorial Policy

Each article and column which appears in *The Amateur Radio Communicator* is evaluated by the Editorial Board to meet a single criteria: how it contributes to NARA's educational objectives. Editorial material is intended to either (1) interest new people in becoming a Radio Amateur, (2) help existing Radio Amateurs get more out of their hobby through better understanding, (3) explain the theory behind some aspect of the service or (4) educate Amateurs on how to retain our valuable spectrum.

How To Contact NARA

The editors of *The Amateur Radio Communicator* and officers of the National Amateur Radio Association want to hear from you. Please send your questions, comments or submissions to:

National Amateur Radio Association
P.O. Box 598
Redmond, WA 98073-0598
Inquiries: 206-869-8052
Orders only: 1-800-GOT-2-HAM
(1-800-468-2426)
FAX: 206-861-5780.
MCI Mailbox: NARANET3
CompuServe: 76702,753.

Editor/Publisher Donald L. Stoner, W6TNS
General Manager Bill Everett, K7RIE
National Coordinator Elizabeth Tackett
Marketing George Ure, AC7X
Technical Editor Terry Dettmann, WX7S
News Editor Fred Maia, W5YI
Instruction Editor Gordon West, WB6NOA
Technical Advisor Dan Lewis, N7NQL
Programming Olan Hanley, KB7GIS
Publication Patricia Meeks, KS7L
Finance Lucy Heenan



NARA

NATIONAL AMATEUR RADIO ASSOCIATION

P.O. Box 598
Redmond, WA 98073-0598

A Bootlegger's Tale

BY DON STONER, W6TNS

One of the wonderful aspects of ham radio is the diversity of our fraternity. There are really many hobbies within the framework we call Amateur Radio. Some hams like DXing, packet transmission of computer data, public service, nets, traffic handling and a zillion other specialties found under the same roof.

A fast growing segment, and one that Henry Ruh, KB9FO writes about this month, is Amateur Television or ATV. The big obstacle to getting on this mode used to be the lack of equipment. In the "good ol' days," almost everything had to be "home-brewed" in some cases, even the camera. But with the arrival of consumer products for home video, the price of cameras and camcorders is very low. At the same time, the quality, performance and resolution of these devices is quite impressive. The interest in ATV has been supported by ham manufacturers such as Paldon, PC Electronics, Wyman Research and AEA, who make superb products like TV transmitters, converters and accessories.

Speaking of the "good ol' days" (which I have been known to dwell on), I have a confession to make to the assembled multitude. Now that

the statute of limitations has long since expired, I can confess my sin and purge my soul of the heavy weight it has carried all these years.

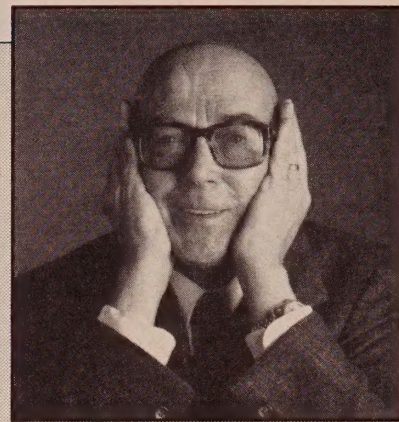
At the risk of sounding like something on the cover of the *National Enquirer*, I was a TV "bootlegger." For newcomers, I should explain the term, as it applies to Amateur radio. A bootlegger is one who operates on Amateur frequencies without legal permission (in the form of a ham license) to do so. It is not something to be proud of, but I am on the FCC records as the first non-commercial TV "bootlegger" in the U.S. The dubious distinction of being the very first "bootlegger" belongs to the Sylvania Corporation. In 1949, they set up a transmitter in Emporia, Pennsylvania to broadcast television to the area residents. Unfortunately, they did so without benefit of formal blessing by the Federal Communications Commission. It was their contention that since Emporia was in a bowl, surrounded by hills, that they could not interfere with licensed stations. The FCC took a dim view of their argument and punched out their lights, so to speak.

Then along came Mrs. Stoner's young son Donald. Picture it—the year is 1950—the place Flint, Michigan. The FCC has mandated a freeze on the granting of new television licenses until they could determine why distant stations interfered with local broadcasters. Many times in Flint, KPRC (in Houston, Texas) would "cream" WJBK

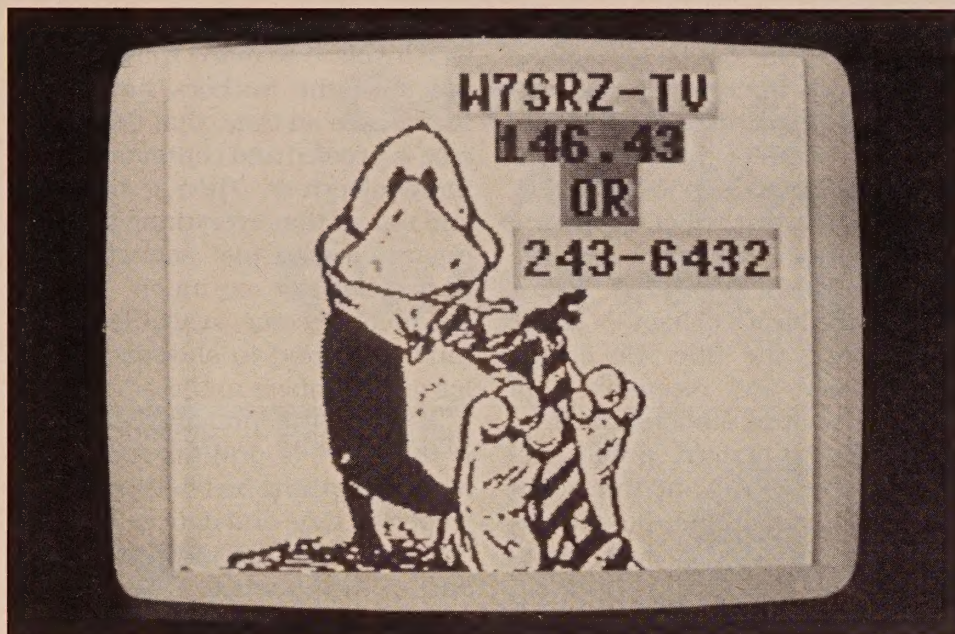
from Detroit, even though their signal had to travel for more than 1,000 miles. Although Channel 12 had been allocated to Flint, no new construction permits and licenses were being released by the FCC because of the freeze.

I was always fascinated by television in the days when WJR in Detroit put on a program every few hours. Between shows they placed a rubber "Felix The Cat" in front of the camera and played Sammy Kaye music on the sound channel. I was in the 10th grade of high school at the time. Other than my dad, I was about the only person in the town who knew how to install a television set. We needed 40-foot antenna masts to pick up Detroit, located 60 miles to the south. The Darby Mast Company put up the antennas and I tweaked and tuned the sets. At 16, I knew the old RCA 630TS chassis like the back of my hand. By the way, I saw one of these sets during a visit to the Smithsonian Museum this summer. Boy! Did I feel ancient. The sets I installed back then are now museum pieces. But I digress.

I wanted to build a television receiver of my own. In 1948, there was a big surplus "store" (actually it was under a huge tent) in Detroit that was almost giving away war surplus goods. They sold a big "boat anchor" that they claimed could be converted to a TV set. I remember taking the Greyhound bus to Detroit (it was safe for a 16-year-old boy to do so in those days) with a



Don Stoner, W6TNS



Station identification signals of ham TV'ers tend to be either humorous or racy. For all you lovers of Opus, here's one of the racy ones.

buddy. I also remember lugging the big beast (the proposed TV, not the buddy) back on the bus. It was built to withstand a direct hit by a mortar and weighed a ton.

Anyway, I got the contraption to make a green picture or pick up the sound—but it could never do both at the same time. You could only tune in one or the other! I consoled my ego with the realization that anybody could build a television receiver, but it took real brains to make the pictures. I decided to make a camera!

My first endeavor was to purchase a 5527 iconoscope tube. There were no vidicons or CDs in those days! It cost \$20.00—which was a fortune in 1950—even considering the outrageous prices I was charging for a television installation. The camera used a chain of 6AK5s (that's a vacuum tube for you youngsters). The camera required a total of 30 tubes altogether and along with the sync generator, it really warmed up the basement at 506 East Pierson Road. And it made pictures. I could see my test pattern with at least 150–175 lines of resolution.

About that time, one of those significant events occurred that affect people's lives—which they never forget.

Earlier I mentioned the television freeze imposed by the Com-

mission. No one knew when the freeze would be lifted or who would be granted permission to broadcast television in the various areas of the country. All except one station—WFDF, the most powerful AM broadcast station in Flint. Day-after-day they propagandized the public with their slogan "When television comes to Flint—WFDF will bring it to you." It was incessant. We heard it before *Amos and Andy*, we heard it after Jack Benny, Fred Allen, and Fibber McGee. They even messed up Reggie and Doc in *I Love a Mystery* with their stupid commercial.

A bright young lad, such as myself, had to wonder how they knew they would be the one selected? While I had no aspirations to broadcast television (if I had only known), why couldn't I be the first one to bring television to Flint? Sure—why not?

The question did cushion shots in my brain for weeks, maybe months. And there was that stupid commercial of WFDF's itching away like a heat rash in my mind.

I couldn't take it anymore—something inside finally snapped! I wired up a 6J6 (that's another tube) modulated oscillator, put six volts on the filament, 200 volts on the plate and connected it to the 300-ohm twin-lead from our Amphenol TV antenna up on the pole. With

an evil glint in my eye, I connected the "kluge" to my camera. A hideous cackle reverberated throughout the house.

What do you suppose—a watt maybe? Probably half that output into the antenna. But my Channel 12 test pattern was seen in Saginaw, Birch Run and Pontiac, not to mention at the studios of WFDF. There was sheer panic in the broadcast executives who had Flint's television future all planned.

As one would expect, they called the FCC in Detroit to see who had been granted permission to use "their" channel. And, as you might suppose, the FCC knew nothing about it. And as you might further suppose, they decided rather quickly that they wanted to know more about this mysterious "melter" of the freeze.

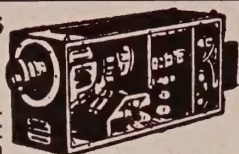
On the second day, I read about my mysterious handiwork in the *Flint Journal*. The idea crossed my mind that this rebellious streak in my nature might be hazardous to my health. I was now 18 and an adult in the eyes of the law. I wisely decided to shut down the transmitter and promptly put an end to my budding career in television broadcasting.

While the FCC moves somewhat slowly, they certainly do move and their movement is inexorable. On the third day, I was visited by a fellow who introduced himself as the radio inspector from the Detroit office of the FCC. And while he was not able to monitor the errant transmission, the word around town was that it might have originated in my neighborhood.

Like a gentleman, he allowed me the luxury of a bold-faced lie that my tripler stage to 432 MHz must have been radiating. He did not embarrass me by asking to see my Amateur license, nor dispute how the 22-MHz discrepancy would make this harmonic interference

NEW RCA SURPLUS TV CAMERA only \$197.50!

Labs, hobbyists, industries, TV technicians—set up your own telecast system! It's a "mechanical eye" for factories, prisons, swim pools, closed circuit TV—100's other uses! **SEND FOR FULL DETAILS TODAY!**
FREE CATALOGUE ON REQUEST!



SURPLUS EMPORIUM, Dept. PE

803 N. Victory Blvd. Burbank, Calif.

Back in the 1950's, ham TV'ers used these World War II surplus cameras. They were mounted in the nose of remote controlled flying bombs and pilotless aircraft (drones). They employed dozens of vacuum tubes and an iconoscope.

possible. He didn't even inquire how I happened to have Channel 12 printed on my test pattern!

It also turned out that the "RI" was W8DX. We reached an understanding that the FCC would not prosecute the case if I took steps to insure this could never happen again and if I would give him the schematic for the television camera and sync generator.

Needless to say, I was more than willing. The phrase \$10,000 or 10 years struck fear in every nerve-ending in my body. I suppose justice was well served. I got off easy and W8DX went on to become one of the "big guns" in ham TV.

Like many stories, this one also ends on a commercial note. While

your introduction to ATV might not be as exciting as mine, it is a fascinating activity. Henry Ruh, KB9FO, has just completed a book called *ATV Secrets For Aspiring ATV'ers*. The way the

book has been organized makes learning the basics of ham TV easier than saying the title. He covers transmission and reception from both earth-bound stations and from space, getting started, public service, balloon, rocket and radio controlled ATV and an index of articles that have appeared in past issues of *ATVQ*, a quarterly publication for those interested in this exciting hobby.

The book, *ATV Secrets*, priced at \$9.98, is available directly from the National Amateur Radio Association at 1-800-GOT-2-HAM or from most Amateur Radio equipment dealers. If you can't find a copy tell your dealer to contact us here at the NARA for an order.

SOME GUYS NEVER LISTEN

When we started *The Amateur Radio Communicator*, everyone advised us that it should be a bimonthly

publication. Putting out a magazine involves so many things; making sure the authors have their material in on time, that the magazine is proofed and contains a minimum of errors. Then it must be laid out so that everything appears organized with just enough white space, but not too much. As new products become available, space must be found to showcase them for our members and readers.

Besides the preparation, there is the chore of printing the magazine. Everything has to be ready on a specific time and date so that the gears all mesh properly. The final part of the equation is addressing and mailing. We've been sending out approximately 30,000 copies each month. In addition to about 10,000 copies to members and our "comp" list to prominent hams, we send the remainder to prospective and new hams. Just making up the mailing list turns out to be quite an undertaking.

Obviously it's easier to do this if we have two months preparation instead of one. As a matter of fact, it seemed that we would just get one issue off to the printer by express mail and it was time to get cracking on the next one!

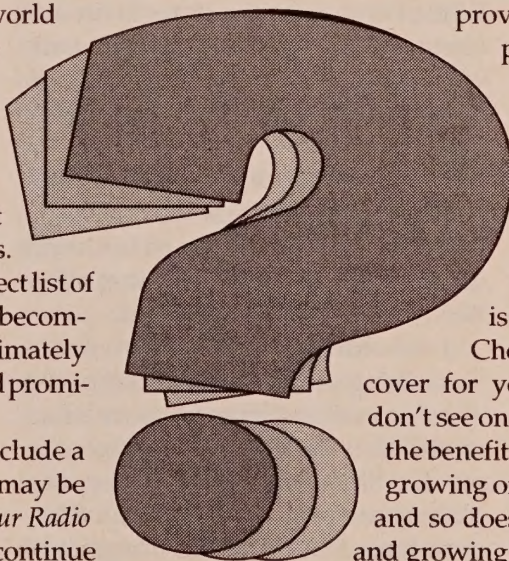
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HOW DID I GET THIS MAGAZINE?

One of the ways we can tell the world about the goals and ambitions of the National Amateur Radio Association is to supply complimentary copies to non-Amateurs. We send copies of each issue to hobby shops and science centers, and about 6,000 pieces to newly licensed hams.

This magazine is also mailed to a select list of people who might be interested in becoming Amateurs. We also send approximately 10,000 copies to NARA members and prominent people in Amateur Radio.

If your mailing label does not include a NARA membership number, this may be your last or only copy of *The Amateur Radio Communicator*. We would like to continue



providing you with this informative publication, but we can only do so if you are a member. For those interested in becoming a ham, or who are newly licensed, a membership in NARA represents an outstanding bargain. A membership, which includes a subscription to *The Amateur Radio Communicator*, is only \$10.00 per year.

Check the mailing label on the back cover for your membership number. If you don't see one, look up about six inches and read the benefits of becoming a member of this fast-growing organization. We need your support and so does ham radio. Help us get it "going and growing!"

Getting On The Air From Wherever You Are

BY MARSHALL KING, N7PIP

You may have seen them during the last parade that marched through your town, carefully watching the activities from their curbside positions as they spoke quietly into hand-held transmitters. Or you may have wondered who they are and what they were doing with their radios if you saw them along the twisting route of a recent road race or bike-a-thon. Or, if you live in an area where violent weather sometimes tears things apart, you may have been too busy with your own problems to notice them supplying communications for the Red Cross and other civic groups who were assisting people looking for shelter.

These are Amateur Radio operators—boys, girls, men and women of all ages—who live in your area and make available both their expertise and their equipment in time of need. Do they enjoy it? For virtually every one of them it's an ongoing adventure too good to pass up, and most Amateurs see it as a great opportunity. "This town has given me a lot," says Arlene Billman, a newcomer to both Amateur Radio and Salina, Kansas, "and this allows me to give some of it back. It's great to be called upon to help out."

She's not alone in her thinking. Of the some half-million Amateur Radio operators in the United States, (hams, to you), most have pledged their availability for communications in times of emergency.



Many of these participants are on the air in "network drills" at least once a week, so that their procedures will be well rehearsed when needed. The communication facilities of the police and fire departments, of the Red Cross and military, are taxed to the limit during times of emergency, and the Amateurs are ready.

Using her hand-held radio and transmitting on an amateur frequency, Roni Oliver invites a friend to come and join the picnic.

During such misfortunes as the recent floods in Fir Island, Washington, where citizens were stranded in lakes that were farmlands the day before, or when high



winds brought down telephone lines and power cables during such hurricanes as Hugo on the East coast, radio is sometimes the only way to summon help and to direct operations when it arrives. "Our purpose is not to physically conduct these events or rescues," says Rich Scoble, President of the Island County Amateur Radio Club, "but to provide the critical communications for the authorities who do."

Lending a hand during times of disaster is by no means the only activities of Amateur operators. Amateur Radio is a recreation enjoyed by a half million Americans of all ages who are licensed by the Federal Communications Commission so that they may transmit on certain designated frequencies. Not

the least part of their gratification comes in being able to make radio contact with virtually every point on earth—even beyond. Orbiting astronauts, both American and Russian, are in on it, too.

Outside of community service, hams spend much of their free time just chatting over the airwaves with both strangers and friends. Most likely these friends are Amateurs they have "known" for years but have never seen. And perhaps never will, for these people may be permanently anchored in Tahiti or Newfoundland, in Scotland or Belize, unlikely or unable to travel. To Amateur Radio operators everywhere, it is only the voices of these friends that are known, not their faces.

Roni Oliver, president of the North Whidbey Amateur Radio Club in Washington State, passes along some tips on short-wave radio to sons Kevin and Charles.

"It's quite a kick," says Bob Frause on Whidbey Island in the Pacific Northwest, "to sit at home during one of our December freezes with the wind howling outside, and talk to another Amateur in, say, New Zealand who is lounging on his lanai trying to keep cool during a midsummer heatwave."

The reversals of our seasons is just one paradox that often occupies the attention of hams on opposite sides of the earth. Differences in geography, types of food, and certainly the varieties of radio equip-

ment, are just a few of the subjects that take place over the airwaves. Since Amateur Radio is strictly non-profit, conducting business is taboo, just as politics is a topic usually avoided. "These are matters easily left behind when hams get together," says Al Fletcher of Anacortes, "for the idea is to share the good part of living, not to repeat the evening news."

Roni Oliver, living in Oak Harbor, Washington, is tireless in her efforts to encourage new people to become hams, and she puts it another way. "Amateur Radio is one of those rare activities that's an education as well as a pleasure, and it's wide open to everyone."

Her husband agrees. Willie Oliver, also a ham, points out that "those already enjoying the hobby have always held out the *Welcome Mat* for others to join in, and it's no different now."

The two questions heard most from people wanting to become hams pertain to what and how to study for the license tests, and how to learn the Morse code. Let's take a look at the first of these.

There are several sources of published study material for helping the newcomer get his license. Some of these are described elsewhere in this magazine, but no matter what source you choose, it is important to note something very different about these study materials compared to the way you were taught in high school, or college, or perhaps in the armed services. In those places you weren't shown the correct answers until you had taken the tests; here you can see the correct answers as you study. And these questions and answers are the very ones that are used in the tests!

This may seem strange at first. But it has been found that when someone is tackling a subject that is totally new to him or her, it is almost imperative that the student be guided by having available the correct answers. This is particularly true where the student is studying privately, sometimes with-

out the help of an instructor, and where a test is to be taken before any associated experience is gained.

You may be wondering then, isn't this just rote memory? Actually it is not. Since the student studies the material before going to the answers, his batting average is quite high by the time he's ready to practice the tests. And, for those occasional topics that may still seem obscure, knowing the correct answers will make them become quite clear when someone starts putting their radio equipment to use.

So, rather than being something to fear, studying for the Amateur Radio license is actually fascinating and fun. But there's a warning here: Since a whole new world opens up, there is a danger of becoming addicted! Ask any ham; one of the hardest things is knowing when to call it a day and go to bed.

Amateur Radio has been around since the turn of the century, yet

each day more young people happily "discover" the hobby as though it was invented just this morning, and their lives take on a new kind of excitement. High school graduate Tom Clarkson of Long Island, New York has a nice way of putting it. "It's like suddenly finding you've been living next door to a beautiful girl and never knew it! A whole new future opens up. Except of course, you don't have to remember your radio's birthday."

For Tom and others it's worth mentioning that even beautiful girls can be found in this challenging hobby, as can tall people, Scorpios, people in wheel chairs and those who are crazy about yogurt. Other interested parties can plunge into this refreshing pool by contacting the National Amateur Radio Association, P.O. Box 598, Redmond, Washington 98073-0598. Not surprisingly, they can also be reached by calling 1-800-GOT-2-HAM! □

MacHamTM OUTSTANDING TESTING SOFTWARE FOR MAC OWNERS

Since the introduction of *The Ham Radio Handbook*, Apple Macintosh owners have been asking for license testing software that will run on their machines. NARA is pleased to announce the introduction of MacHam for the new no-code Technician license, clearly one of the most elegant and useful Amateur radio programs ever written for the "Mac." And, it's a perfect companion for *The Ham Radio Handbook*.

Because of the superb Mac graphics, all required circuit diagrams are displayed with the question right on the screen. If the test is printed, the diagrams are included.

The flexibility for training is excellent. The tests can be taken on screen, by element or by chapter, with options of immediate or end-test scoring. Printouts, of interest to VE's, create exact VE style exams, with pool question

numbers, correct answer key and blank answer sheets as desired.

One of the most unique aspects is the glossary of needed radio terms that are included online. If you don't understand a word, you simply look it up!

You'll get quite a surprise when the program loads. Not only is there a picture of a rotary beam, the sound plays the "Fifth Symphony" (you know the one where the whole orchestra goes di-di-di-dah).

MacHam is available *directly from NARA* and is priced at \$34.95 (\$2.00 S&H) by itself or \$49.95 (\$3.00 S&H) when included in the Education Package rather than the IBM software.

MacHam was developed by Richard Coyne and is a product of the Coyne Software Group.

Mastering The Morse Code

It is easier to do than you think, but there are certain things you need to know.

By Frederick O. Maia, W5YI

NATIONAL VOLUNTEER EXAMINER
COORDINATOR

The code used to be considered the communications medium of the last resort, but no longer. Today, there are simply more reliable ways to move information. Satellites are predictable; sky-wave propagation is totally erratic; sort of like fishing. You can catch a good one when the conditions are right! And that is the big attraction of ham DXing—landing as many good ones (countries) as you can. But for the professional, Morse code is on the way out. There is no doubt about that!

Even the International Maritime Organization (IMO) is in the process of phasing out telegraphy for its radio officers aboard ocean-going vessels. The maritime industry will now resort to satellite technology—something that wasn't invented when the Titanic's radio officer gallantly pounded out "SOS" as it headed toward the bottom in 1912 with 1,500 passengers.

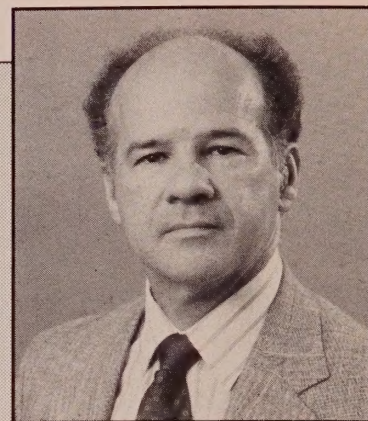
For now, however, if you want to work DX (long distance international contacts) on the high frequency bands you must first learn the code! The international law doesn't specify how fast you need to be able to send and receive telegraphy, only that you must be Morse code literate.

Some Amateurs feel that you aren't a true ham unless you know the code. I don't buy that at all! Today's telecommunication technology advances are not being made by telegraphers but by experimentation in electronics and computer technology. It is senseless to hold back high-frequency research because the experimenter does not have code knowledge.

Also the Amateur Service exists for more than telegraphy and advancing the radio art. It exists for training operators, for enhancing international good will, for providing emergency communications in times of need or just for non-commercial public communications. There's nothing wrong with just social "rag-chewing." And the ham radio hobby might just point a youngster in the right direction, a direction our country badly needs to compete in the international arena.

Our FCC (with the agreement of the Amateur community) has set three code proficiency speeds: 5, 13, and 20 wpm. The faster speeds get you more of the better HF (high frequency) DX bands. You have to learn the code to communicate long distance. Let's discuss the best way to go about it.

Actually the code can be fun! Most of my (nearly four decades) of high frequency hamming has been spent "pounding brass" although today, there are all sorts of gadgets that can automate telegraphy. Computers and other microprocessor-based "toys" are great for storing, sending and receiving Morse code.



Fred Maia, W5YI

As we mentioned last month, there is very little difference between smoke signals, jungle drums, Morse code, radioteletype, computer-to-computer packet radio or even spread spectrum. It is just a case of how you digest the digits.

THE STEPS TO SUCCESS

1

Forget about dots and dashes! Copying Morse code by ear is a matter of matching sequences of short and long sounds separated by short and long spaces. The short tone is known as a "dit," the longer one a "dah." A "dit" has a time duration of one, a "dah" is three times as long. We say "dits" and "dahs" because a dit takes only one third of the time to say as the word "dah."

Therefore, the letter "R," should be learned as di-dah-dit because that's the way it sounds when transmitted. Ordinarily, the time space between elements of a character has a duration of one, with three elements between characters. A seven time unit space separates words.

2

We often hear an examinee say "I can copy ten wpm, but am having trouble copying faster." They have reached the dreaded "plateau." This is usually because they learned the slower speeds with *regular* rather than *Farnsworth spacing*. You can get away with the dot-dash-dots or

regular spacing method at the 5-wpm level, but you will have a problem passing the 13-wpm test. The sound patterns must be learned right the first time.

Avoid the speed plateau. Learn by Farnsworth spacing! The three-unit space time duration between characters can be stretched out to make the code elements themselves stand out more. This is known as the Farnsworth method. Farnsworth spacing is usually used at the slower transmission speeds so the characters will maintain their exact sound characteristics.

While a computer can easily differentiate di-dah-dit at any spacing speed, the human brain gets confused with regular spacing when the transmission speed is under ten words per minute. The slower the speed, the more di-dah-dit sounds like the letters E-T-E, dit, dah and a dit.

I recommend the spacing be set to at least 15 wpm when learning at the slower speeds. This is the spacing speed the FCC used when they administered their 5- and 13-wpm telegraphy examinations. It's also the speed that the W5YI-VEC uses in their prepared examinations since it matches the FCC's published CW (continuous wave) test standard.

The ARRL-VEC uses 18-wpm character speed in their 5- and 13-wpm Morse code exams. Their reasoning is that the code character will sound about the same when you take your Extra Class 20-wpm code test. Both the W5YI-VEC and ARRL-VEC use 20-wpm character speed for the 20-wpm telegraphy exam.

3

Learn from a good code teacher or course. Actually the FCC does not care what the telegraphy test character speed is—as long as the speed nets out to 5, 13 or 20 wpm. We allow our W5YI-VEC examiners to use any character speed they (or the applicant) wishes. This is ac-

complished by using special computer software with programmable spacing.

It is of paramount importance that you learn the code right the first time. You can "teach an old dog new tricks," but you must correct its bad habits first! It might cost less to learn from a friend, but you might have to unlearn first! Beginners sending code back and forth to learn hardly ever works! You should be listening only to well-formed code characters. If your teacher isn't a seasoned telegrapher, use only a computer or audio course to learn the code.

4

Learn to copy behind. Although theoretically a person can write as fast as 30 wpm, you will find at some point that you have trouble putting a character down on paper as fast as it is being transmitted. This normally occurs around 15 wpm. Practice not writing the code character until the next one has been sent. Then try copying two characters behind, then three, four more. Try copying behind at faster speeds.

You need to "get the character flow" going from the subconscious to the conscious. Separate the listening function from the writing function. Eventually you will find that you will be hearing groups of characters and words rather than individual letters. Common words like "the," "and," "but," common abbreviations, suffixes and Q-signals will almost sound like a word rather than a bunch of single characters. I haven't heard the dah/dits in the word "the" for years!

"Getting the flow" going can only come from practice. You almost have to think in code. You can practice anywhere. A good exercise is to say road signs to yourself in code di-dahs as you drive down the highway. Actually being a telegrapher is much like driving a car, beginners tend to concentrate on their driving—rather than listening to the

radio or carrying on a conversation. With experience, driving eventually becomes much more automatic. Some people even drive subconsciously on automatic pilot so to speak.

Another exercise is to try doing more mental things at once. Try reciting the alphabet several times while simultaneously writing the numbers from one to a hundred. Goofy, but it can help.

5

Don't anticipate. Don't read what is being transmitted. Just write the characters down. You will be given time to correct your test copy before turning it in and you will be able to decipher later what you did copy. The volunteer examiners are authorized a wide variety of code test answer formats.

Most VE's require one minute (out of five) of solid copy, or answering seven out of ten questions asked about the transmitted code text. Some use multiple choice or fill-in-the-missing-blank word answer formats, which most examinees feel are easier to pass. It is up to the VE team as to which format they use.

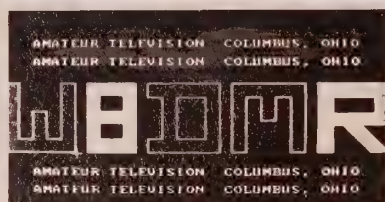
Also, practice writing fast. There is a difference of opinion whether printing or handwriting is better. I prefer printing since this is the way I was professionally trained in the military. We had to put a slash through the zero, a horizontal line through the middle of the "Z" and the bottom of the "I," this way they wouldn't be mistaken for the numerals zero, two and one.

This was important since we frequently copied encrypted random character groups. I can still remember copying messages I couldn't read during the Korean conflict! I was only eighteen at the time. Two or three of us copied the same CW message and handed it in to the "crypto" operators for decoding. I also remember old Sergeant Joe who copied code better drunk than sober and how he couldn't spell

NARA thinks hams should be SEEN as well as heard. If you've got one of these...



...you can be one of these



And Henry Ruh, KB9FO, tells you how in his book, "ATV Secrets For Aspiring ATV'ers." It contains everything you wanted to know about Amateur television (ATV) but didn't know who to ask! There's no Morse code test for a license to get on ATV. All you need is a little imagination and any class ham license. Amateur TV is fun and exciting. Only your imagination limits what you can do with it. Take those home productions and explore new audiences, create new activities, make new friends and enjoy your video equipment more. Remember—hams should be SEEN as well as heard!

"ATV Secrets" is only \$9.98 at your radio equipment dealer or direct from the NARA (add \$2.00 shipping and handling).

ORDER YOUR COPY TODAY FROM



NATIONAL AMATEUR RADIO ASSOCIATION
P.O. Box 598
Redmond, WA 98073-0598
Call Free 1-800-GOT-2-HAM

the words right but properly received the message. It took me years of practice to understand how that worked.

Actually it was a wonder that both myself (and my twin brother—also a ham) even became military radio operators. Both of us have an inherited hearing problem. Neither of us can hear tones higher than a few thousand cycles in frequency. Actually it helped us since we had built in filters. We merely adjusted the BFO to a lower tone. Other operators heard signals we did not.

High-tech back in the 1950's was Baudot radioteletype received in a mobile 6-by-6 van using a BC-610 transmitter, an R-348 receiver and a Model 15 printer. Today secret messages are spread across the spectrum and transmitted under the noise level.

6

Learn to send properly. However, if you only want to pass a telegraphy test to work the voice mode on the high frequency bands, I say forget about sending. Although they could, very few VE teams test you on hand sending. The FCC doesn't require it—and has correctly taken the position that if you can receive code, you can also send it. Once you learn the code character patterns, sending is easier than receiving the code.

Therefore, if you really want to be a telegrapher, sending should be de-emphasized until you can receive properly. It is an obvious fact that you can't send proper characters unless you know what they sound like. Most people can send faster than they can receive—once they know what the character should sound like.

7

Listen and operate on the air! If you want to be good at Morse code you have to do it regularly. You should operate on the CW ham bands once you know what consti-

tutes good code characters. It is generally accepted that you should send only as fast as you can receive. A better idea is to send a little faster than you can copy. This will help increase your receiving speed since the other station will assume you can copy the speed you are sending.

Good luck on mastering Morse code—whether to only pass the telegraphy test or to actually get on the Amateur CW airwaves and tickle the key.

73, DE Fred, W5YI

Fred Maia, W5YI
National Volunteer Examiner Coordinator
P.O. Box 565101
Dallas, Texas 75356

THE W5YI-VEC

The **W5YI-VEC** is a very large organization of Amateur Radio operators who periodically conduct ham license examinations in most large cities across the country. The W5YI Group also distributes most commercially available license study material; both for the Morse code and written tests. They may be reached at 1-800-669-9594 during regular business hours.

The W5YI-VEC is always on the lookout for Advanced and Extra Class level Amateurs who would like to assist the ham radio hobby grow by conducting periodic license examinations. Let us know if you are an Advanced or Extra Class level Amateur and wish to participate in our testing program. You may request a VE application by writing:

W5YI-VEC
P.O. Box 565101
Dallas, Texas 75356

Publicizing Your Upcoming Classes



Gordon West, WB6NOA

BY GORDON WEST, WB6NOA

Imagine the power of publicizing your upcoming Novice class with a literature rack at every Radio Shack store in town. Even if you are already advertising your ham class at a local ham store, get ready for some terrific publicity, courtesy of Radio Shack.

"Our stores are authorized to let Amateur clubs post notices of meetings, testing schedules, and classes. If there is any problem have the store personnel call me, and I will confirm that it is okay," comments Ed Juge, W5TOO, of the Tandy Corporation. Ed points out that it is no longer necessary to write him for permission to get your class flyers onto Radio Shack counters.

The timing of this clarification on class flyers at Radio Shack stores coincides with the availability of new 2-meter equipment, adding to Radio Shack's line of 10-meter equipment and other Amateur Radio accessories. Your counter top display of upcoming ham classes makes it easy for Radio Shack personnel to tell anyone looking for ham classes exactly where they can be found. Nothing beats the convenience of simply pointing over to a Plexiglass rack containing your class flyers.

If you are also a member of the American Radio Relay League Amateur Radio instructor core, chances are your name, address, and phone number are already on file at local



Radio Shack will now allow class announcements to be placed on their counters.

Radio Shack stores. Each store has an ARRL supplied data base of local "Helping Hams" (Elmers), clubs, and examinations.

Rosalie White, WA1STO, Educational Activities Manager for the ARRL says, "If you are an evening instructor, your name will be given to those people from your area who request information about classes, unless you choose not to have us do so. Everyone will be sent announcements about our workshops that take place in their area. The Educational Activities Department program exists to help evening instructors and school teachers. Drop us a note to get our materials. You will also be asked to fill out a card that gives Radio Shack permission to include your name as a local resource for a beginner to turn to for help or testing."

Once you are onboard the ARRL instructor program, you'll receive the following:

- Publicity brochures, posters and information on videotapes
- Information on the ARRL educational publications for students and instructors

- A quarterly instructional newsletter containing successful ideas from your colleagues
- Pertinent news from the FCC
- For those qualified to give Novice exams, request sample exams
- Graduation certificates and operating aids

Now imagine the "pulling power" of a professional looking rack, filled with ham radio information and ham class announcements! Make sure your rack is professional looking—don't just go into any Radio Shack store with a handful of flyers that will probably blow all over the place, unless they are secured down in some sort of a rack.

If you're going to go to the Radio Shack store with your information rack, I suggest the snap-lock, clear-molded, literature holders available from Siegel Display Products, P.O. Box 95, Minneapolis, Minnesota 55440. Their counter easel 3-pocket rack, style C503, holds three 9½"x1"x12" brochures. They will give your class announcements and ham radio information sheets that professional look necessary for the area that the Radio Shack store manager makes available for your display. Go in with the best looking racks possible, and start out your relationship with your local Radio Shack stores in a professional style.

You will need to service your racks almost on a weekly basis. If you're going to the trouble to order 10 or 20 racks, be sure you have enough class literature on hand to support your new "free advertising" program.

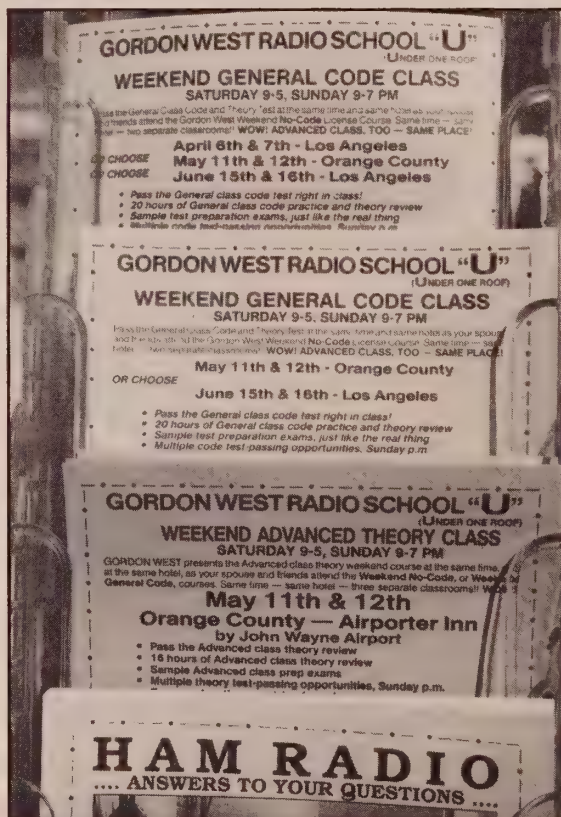
For those who may be teaching a commercial Amateur Radio class, let's not

spoil it for the hard-working instructors teaching for free. Don't ask an organization for free publicity when you are teaching to make a profit. Rather, let those instructors teaching for free, or teaching for expenses only, to have their racks in place at Radio Shack. Classes for hire should resort to normal commercial advertising.

The same goes for testing your students. If you're teaching for free, or just receiving remuneration for actual expenses, it's perfectly okay to be one of the examiners for your own class. But if you are teaching for a profit, or are teaching as part of a training school, then leave the testing to outside Volunteer Examiners (VE's).

"Amateur radio classroom instructors may act as Volunteer Examiners for their students only when any tuition or amount charged does not exceed out-of-pocket expenses," comments Fred Maia, W5YI VEC. "Compensated teachers or profit-making schools should not participate in the examination process," adds W5YI. He points out that paid instructors can

(Continued on page 16)



CQ ALL SCHOOLS ON THE AIR

Every Tuesday and Thursday morning, at approximately 1800 hours UTC, Carole Perry, WB2MGP, and Gordon West, WB6NOA, go on the air with the 10-meter CQ ALL SCHOOLS net at 28.303 MHz. If you are teaching a day class, or teaching in the school systems be sure to tune in. Join Carole and Gordo for a lively classroom-to-classroom contact. Prepare to QSY up the band as soon as you make contact with another classroom on the air.

Find a location in the Radio Shack store where your class flyers can be seen. The plastic rack will hold your flyers neat and orderly on the counter.



ATV

Ham Television



Henry B. Ruh, KB9FO

BY HENRY B. RUH, KB9FO

Tired of producing wonderful home videos and having no one to show them to? Now you can have an audience! For all of you "Captain Videos" out there in "hamland," there is an outlet for your programming skills, "video-itis" and desire to communicate. You can share your visions of the world and have fun and perform a public service along the way.

Perhaps you caught the article in the August 27th, 1988 issue of *TV GUIDE* or the September 16th story on *NBC Nightly News* with Tom Brokaw. You may be familiar with ham radio, those folks with the big antennas in the back yard or all over their cars. A specialized area of ham radio is Amateur television (ATV). ATV is a mode of communicating on the UHF ham radio bands using standard TV signals just as you receive on your home TV. These are full moving pictures with color and sound, not to be confused with facsimile (fax) or still images (slow scan TV). There are about 5,000 U.S. TV hams and about an equal number in the rest of the world who have their home video "goodies" connected to their ham radio gear. They enjoy two way live video exchanges. These are called QSOs, ham shorthand for



contacts. There are two high quality international publications which support the ham TV operators with technical and operational information. The U.S. publication is *Amateur Television Quarterly* which is a full size, full color magazine. The British publication is *CQ-TV* a highly regarded small format journal of interest to readers using non-U.S. TV standards (PAL/SECAM versus our NTSC).

Ham TV stations can typically communicate over distances of about 20 to 60 miles under average conditions limited by local terrain. The range is much the same as for broadcast UHF TV stations. But hams employ receivers that are many more times more sensitive than your home TV set and they

Above is a photo of a full-color ATV picture that was transmitted 70 miles from Dayton to Columbus, Ohio. Bob Parker, W8DMR, received this picture by using an 88-element J-Beam receiving antenna at a height of 45 feet with 9913 coaxial cable.

use very high gain directional antennas. These techniques allow a range equal to mega-watt TV stations, while transmitting only a few watts. When conditions are above average, the ham TV operator can send and receive a live TV signal hundreds of miles. This occurs when there is an atmospheric temperature inversion (cold air under warm air). A recent record was established between central Florida and Austin, Texas, a distance of



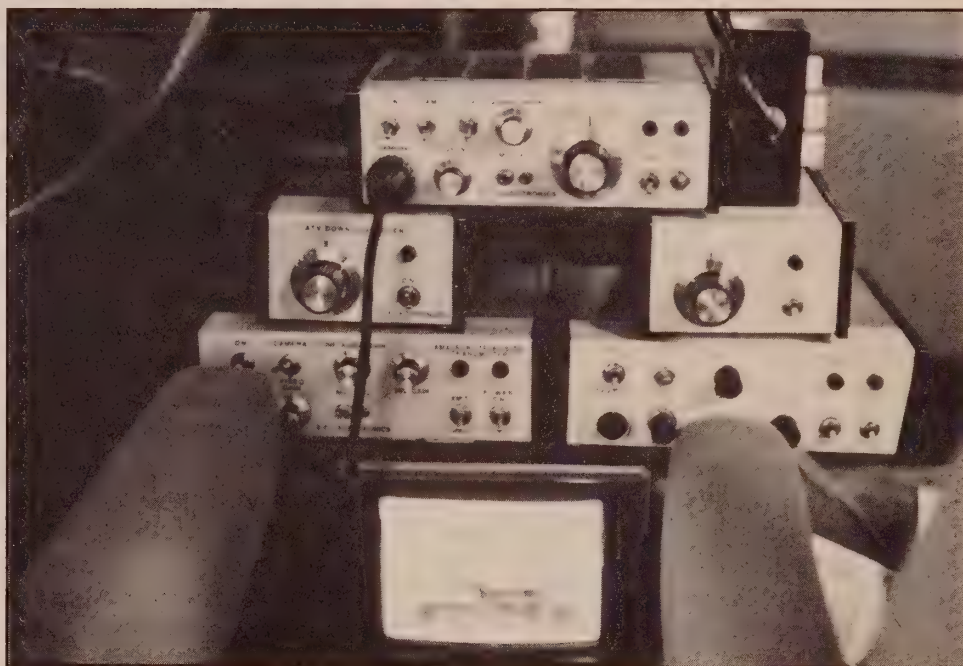
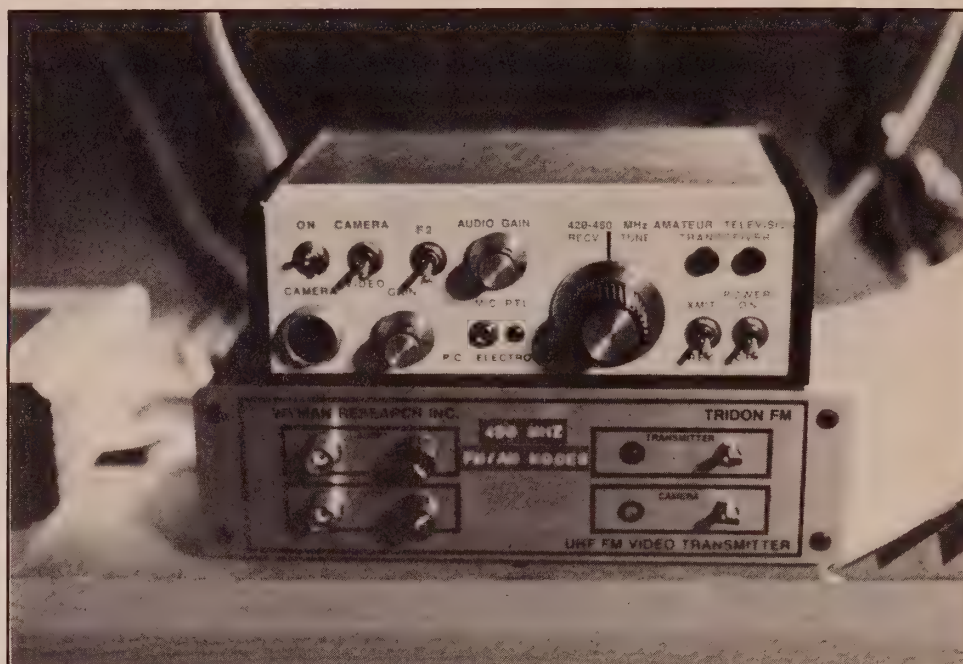
(Right) Two popular ATV units. On the top is a PC transceiver and on the bottom is a Wyman transmitter.

(Bottom right) The author's three-band mobile ATV. KB9FO is having a QSO with W8BJN. At the bottom and center of the photo, you can see W8BJN's transmission on the monitor.

about 1,050 miles! This was a path over the Gulf of Mexico. Transmissions over land are not quite as good, but the current record is still an impressive 700 miles!

What else do ham TV operators do? Besides transmitting pictures of themselves, the family, and ham radio equipment, they can transmit just about anything and from just about anywhere! Ham TV is used in public service to provide the "eyes" of public safety officials. Typical uses occur during parades, walk-a-thons, bike-a-thons and other activities which cover large distances or large areas. The biggest ham TV "event/show" is the Pasadena Rose parade which utilizes 50 hams and 16 ham TV stations along the parade route. A 4½ hour professionally made VHS video tape is available showing the parade coverage from the ham TV facilities. It can be ordered from *Amateur Television Quarterly* for \$20 post paid. Of the 16 ham TV stations, two of the stations are mobile on motorcycles and one in a ham owned helicopter. Each transmits in turn as requested by the control station, who is also in voice contact with each TV station on "regular" Amateur radio. Officials wanting to view any particular area make a request to the control operator, who then selects the ham TV station which can televise the area of interest. This is exactly the way the "big broadcast stations" do it, only with more cameras! The operators all initiate video if they witness problems with parade progress, float breakdowns, people needing medical attention and other emergencies.

Ham TV has been transmitted from every known type of transportation including cars, trucks and



vans (very common), boats, planes, motorcycles, bikes, hot-air balloons, model rockets and helium balloons which have reached the edge of space at 130,000 feet altitude!

Hams also weather watch, often with tower mounted cameras and links to the national weather service radar sites. One such TV ham in Tulsa, Oklahoma, Warren Weldon, W5DFU received a White House commendation for his public service in this area. Hams can re-transmit NASA video and often have continuous coverage of the space shuttle and other NASA events received by their home sat-

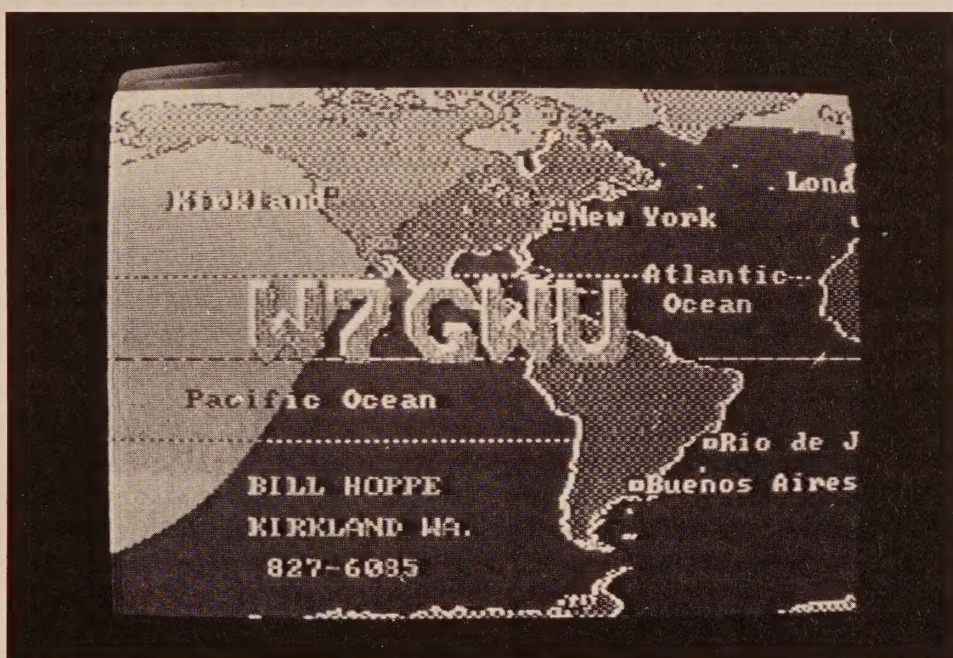
ellite dish. Hams are also trying to send their own TV station into space. And of course, hams talk to other hams, just to be social.

As the name implies, Amateurs are really "hams," often producing their own "programming" for audiences of few people. These "productions" can be video of travel, family activities, putting up the "big antennas" or whatever your mind can imagine and your video equipment can produce. Hams like to tinker and are curious about many things. Often other hobby activities outside of ham radio provide the "program" of the night.



(Left) One of the most prominent ham TV operators in the Pacific Northwest is Chuck Northcutt, W7SRZ. Chuck is a bit out of focus in this photo, but you would be too if you had to figure out how to turn on all that equipment!

(Bottom) Test pattern for Bill Hoppe, W7GWU, from Kirkland, Washington, as seen on K7SRZ's monitor.



Video is also used to link other forms of communication. Any computer user can take the video output to his CRT screen and connect that to the video input of the ham TV transmitter to send the screen video live to friends. Likewise, you can use the audio to simultaneously transmit the data or program that makes the graphics or video appear!

You can connect any TV camera or camcorder using the regular video/audio output jacks to connect to the ham TV transmitter. Even the audio/video from your home VCR can be used. In short, if

you have any video source, you can transmit it over ham TV! Broadcasting is not permitted. This is defined as a transmission intended solely to be received by "non-hams." Broadcasting of music is also forbidden but you can transmit just about anything else your local friends are not too tired to watch!

Every night, just about everywhere, a ham TV'er is going to be on the air around 420- to 450-Mhz, usually at 439.25 Mhz or 434.00 Mhz, transmitting live video to his ham buddies and friends. This is just below UHF TV broadcast channel 14. Amateurs have also built

about 150 ham TV repeaters. They are located in just about every major city in the U.S., which allows something like "community access telecasting." The repeater receives the transmitting ham's TV signal and re-transmits it on a different channel (frequency). This re-transmission occurs from a high elevation location so that all the ham TV operators and other viewers can see and hear it.

Other viewers? Yes, ham TV can be seen by anyone who knows where to look! The popular ham TV signal frequencies happen to coincide with CABLE TV channels. This is because the CABLE TV people choose to use all the non-broadcast TV frequencies which are used over the air by all sorts of licensed radio users, including several Amateur radio bands.

Ham TV transmissions are low power TV. The ham TV station may use up to 1500-watts transmitter power and as big an antenna as he or she can afford! Typically the Amateur TV operator will use low power between 1 watt and 100 watts, or "high power" which is 500 to 1500 watts. Like any TV signal, the more power effective radiated power (ERP-transmitter power plus antenna gain), the farther the signal will go. If you live close to one of the repeaters, or close to a TV ham, you can tune in their transmissions with your VCR or cable-ready TV set.

This means the tuner in the TV would pick up cable stations without a converter box if it were connected to a cable system. Most modern sets are "cable ready" or "cable compatible" which means they will tune the frequencies not used for over-the-air broadcast TV



as well as regular broadcast TV channels. Usually there is a switch you use to select *air* or *cable*. It is important to note that the cable channels are not the same frequencies as UHF broadcast TV channels. Cable channel 60 is not the same as broadcast channel 60 for example. Cable TV channels 57, 58, 59 and 60 happen to be almost the same frequencies that ham TV operators use. While the two middle channels don't exactly coincide, your TV set or VCR can't really tell the difference because it's so small compared to the six MHz wide TV channel. The automatic frequency control (AFC) circuit will still lock in on the ham TV signal.

To look for ham TV signals, select CABLE channels, and then connect your outside UHF broadcast TV antenna to the cable/VHF input jack on the TV or VCR. This is the same place to which your CATV cable would connect. The best times to tune for Amateurs are at night and on weekend mornings or eve-

nings, often after 10:00 PM local time. Also, atmospheric conditions are best for UHF TV at night. The ham TV operators also use very directional antennas to "squirt" their few watts toward the station they are viewing. You may be in front of the antenna pattern or on the back, in which case you may not be able to receive any signal. Patience should net you some signals. You can ask a local ham or Amateur radio store in your area to get more information about local operations to help you locate an active ham TV station.

Any licensed Amateur Radio operator can transmit pictures! A Technician or higher license is all that is required to transmit TV on the UHF and higher bands (420 Mhz and up) and there is no Morse code requirement. Information on obtaining an Amateur Radio license is available from a great number of self-help books you can purchase in Amateur stores. These same books are advertised in ham radio

publications. Local clubs advertise training classes, usually in the same radio stores where you find ham radio magazines for sale. Training aids are also found in *The Amateur Radio Communicator* or by calling the National Amateur Radio Association at 1-800-GOT-2-HAM.

Ham TV is fun and exciting. Only your imagination limits you to what you can do with it. Take those home productions and explore new audiences, create new activities, make new friends and enjoy your video equipment more. Involve the family. As we say, "hams should be seen as well as heard!" We look forward to seeing you on our ham TV sets! □

Have we gotten your interest?

For more information about ham TV, contact: *Amateur Television Quarterly*, 1545 Lee St., Des Plaines, IL 60018. A sample issue is \$4.00. The subscription price is \$15.00 per year (U.S.).

ON THE COVER

(Continued from page 1)

assistant packages ICOM radios for ham operators everywhere.

Also pictured are the Micro 2AT, the IC-28, the IC-901, the IC-275 and an IC-27, obviously something for everyone.

Happy holidays to all and many thanks to ICOM America, Inc., 2380 116th Avenue NE, Bellevue, Washington 98004 for permission to use their photo. □

IN MY OPINION

(Continued from page 4)

Although we have been able to maintain the schedule, we've discovered why all the publishing guru's suggested that we start as a bimonthly. A lot of tasks that NARA should be involved in have not been undertaken or, in some cases, not completed. We at NARA don't find this acceptable.

Therefore, to make a long story short, the decision has been made

to do what we should have at the beginning of our publishing odyssey. We are establishing a bimonthly schedule for *The Amateur Radio Communicator*. The next issue will be dated January/February, 1992.

Now, for those of you who are already members, and for those that join until December 31, 1991, you will still get the number of issues we promised. For example, one-year members will still receive 12 issues, two-year members will still receive 24 issues and three-year members will still receive 36 issues—even though you get them every other month. Members joining after December 31, 1991, will enjoy the bimonthly issues. Membership rates will remain the same. For now, 73 DE Don, W6TNS □

TEACHING THE HAM CLASS

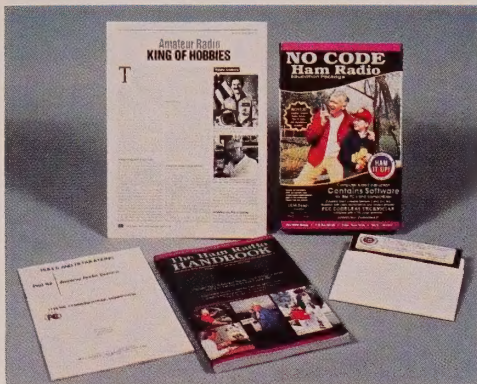
(Continued from page 12)

easily enlist the aid of outside VE's to examine their students.

Fred also encourages instructors who may need a clarification on this rule to contact his education office at 1-800-669-W5YI (9594). "Effective immediately, upon request, all written and telegraphy examination software is available, without charge, to our contact Volunteer Examiners," adds Maia.

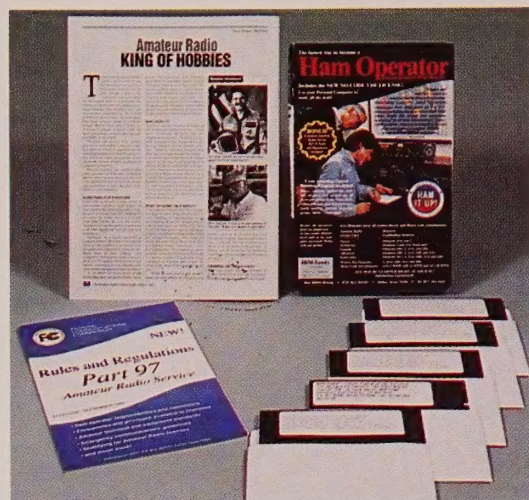
So—how are you advertising your class? If you are a volunteer instructor, take advantage of the Radio Shack offer. But be sure to go in with a professional looking rack, and give the entire Radio Shack store personnel a big thanks for helping support the Amateur Radio service. Encourage them to tell those unlicensed customers interested in the Amateur Radio equipment to pick up your flyer, and enroll in a class. The store personnel will sincerely appreciate all your help in assisting them in their Amateur Radio recruitment efforts. 73, Gordon, WB6NOA □

AVAILABLE FROM NARA



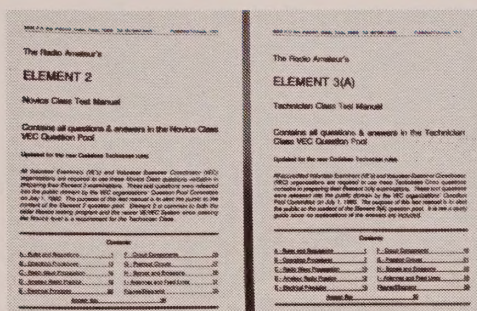
Pass The New Codeless Technician Test!

The NARA Educational Package from the National Amateur Radio Association includes: *The Ham Radio Handbook*; IBM compatible software (5 1/4") to test your knowledge; extensive list of Contact Volunteer Examiners; ham radio FCC Rules and Regulations; *Amateur Radio—King of Hobbies* (a publication explaining what Amateur Radio is all about) and we'll send a free issue of *The Amateur Radio Communicator*. The NARA Educational Package is just \$29.95 (3.00 S&H).



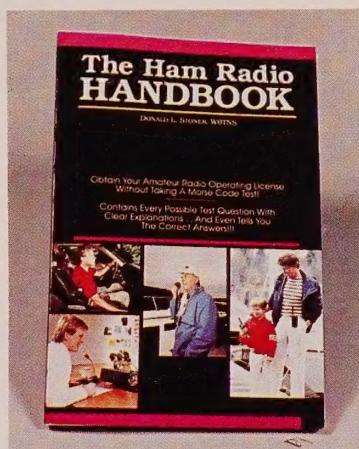
Taking a Ham Radio Test?

This amazing collection includes self-testing programs for every license class plus Morse code. Study all 1,931 questions by license class and supplement. The software (IBM 5 1/4" disks) covers the Novice, Technician, General, Advanced, Amateur Extra and Morse code. Each disk includes every possible test question and multiple-choice answer. You can take sample ham tests right at your IBM or compatible keyboard by selecting the correct answer or print out tests just like you will be given during a testing session. The program prompts you if the answer is incorrect and tabulates your score both in numbers and percentage correct. This is the definitive work for anyone wanting to go "all the way." The **Ham Operator Package** also includes a copy of Part 97 of the Rules and Regulations, an extensive list of Contact Volunteer Examiners, a copy of *Amateur Radio—King of Hobbies* and we'll send you a sample issue of *The Amateur Radio Communicator*. The **Ham Operator Package (IBM)** is only \$29.95 (\$3.00 S&H).



The FCC Question Pools

Each booklet contains all the questions and answers for each license class. Does not contain any explanations. Order your booklet by license class \$3.00 each (\$1.00 S&H) or order the Novice and Technician classes together (all the questions for the new code-free Technician class license) for \$4.95 (\$1.50 S&H).



The Ham Radio Handbook

The leading book for anyone wishing to earn the new code-free Technician license. Includes every question you might be asked during a test session, plus the multiple-choice answers. **The Ham Radio Handbook** is the only test manual that explains in detail why the correct answer is correct. Includes simple and easy-to-understand theory along with many photos and drawings. The book divides the test questions by subelement, devoting a chapter to each. The appropriate test questions and answers are given at the end of each chapter. The list of correct answers is included at the end of the book. Guaranteed to provide all the information needed to get your ham radio license. **The Ham Radio Handbook** is only \$9.95 (\$2.00 S&H).

The Rules of the Road

It took the Federal Communications Commission nearly two years to completely overhaul the Amateur Radio Service Rules to reflect current technology and Amateur operations. The FCC also deleted many unnecessary, obsolete, and redundant rule provisions.

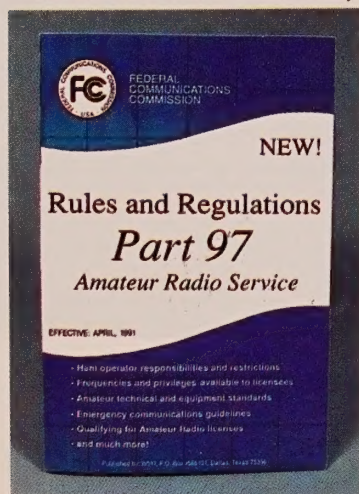
The new rules have now been totally

reorganized and revised into Part 97 of Title 47 CFR (Code of Federal Regulations) which covers all rules and regulations governing the Amateur Radio Service. Over 60 pages of information—a must for every Amateur to have in the ham shack. This booklet is priced at \$4.95 (\$1.00 S&H).

Having Trouble with Code?

The **Morse Academy (IBM)** software actually teaches all 43 required code characters and then steps you up through the Amateur Extra 20-wpm level using sophisticated computer aided instruction techniques. Adjustable tone, standard or Farnsworth spacing. Sends text or random generated characters—even properly constructed code exams. Many features—plus a 40-page on-disk manual! (5 1/4" disk) is only \$14.95 (\$1.50 S&H).

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For the fastest service, call NARA at 1-800-GOT-2-HAM (1-800-468-2426)

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Who Reads The Amateur Radio Communicator?

- Anyone interested in obtaining an Amateur Radio license
- New Amateur Radio operators
- Public and private school teachers who want to introduce their students to Amateur Radio
- Amateurs who are now, or want to become, ham radio instructors
- VE's (volunteer license examiners) who administer the Amateur Radio exams
- Amateurs concerned about the future of the Amateur Radio Service

What Will You Gain When You Join NARA and Receive the Communicator?

- 1 You'll get the latest facts on what's happening in Amateur Radio
- 2 The knowledge to help you get the most from the Amateur Radio Service
- 3 You'll be helping to insure a solid future for the Amateur Radio Service

This means an exciting future for you as an Amateur Radio operator!

Here's What You'll Find in the Communicator!

The Amateur Radio Communicator will include clear and informative articles on topics such as:

- Passing the Amateur Technician Class exam
- Erecting your first antenna
- Different types of Amateur communications
- Getting materials for your radio classes
- Classroom demonstration techniques
- Obtaining commercial support for your classes
- Keeping your students motivated
- Publicizing your Amateur Radio class
- The latest details on rules and regulations
- Up-to-date information on the VE program
- The latest news on proposed changes to the Amateur Radio Service
- Repercussions that regulation changes will have on the future of Amateur Radio

NARA publishes the only non-commercial ham magazine that addresses these subjects in a simple-to-understand manner.

What's NARA Doing?

The goals of NARA are to:

- Get more people licensed in the Amateur Service.
- Save the various Amateur bands (frequency ranges) from confiscation by commercial interests.

▶ In the past year, Amateur Radio has lost part of the 220-MHz band and, in some areas of the country, is in the process of *losing access* to another band (900 MHz).

NARA is striving to get more people involved in the Amateur Service so we can increase activity and retain our remaining Amateur bands.

When you join NARA, your membership dollars will be used to **further these goals**. Let's face it—with a subscription cost of only \$10.00 per year, **you won't find a better value in Amateur Radio!!** Join today! It's easy. Just complete the subscription form below and mail your check or money order. For the fastest service, call 1-800-GOT-2-HAM (1-800-468-2426) with your Visa or MasterCard number.

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